obvious over the combined teachings of Japanese Patent Document No. 2000/203818 to Takei, et al., and of U.S. Patent Application Publication No. 2001/0033822 to Ishii, et al., under the provisions of 35 U.S.C. § 103.

In connection with the rejection of claim 1 under the first paragraph of 35 U.S.C. § 112, the Examiner contends that there is no support in the original specification for the recitation that the layer of carbon is formed on the surface of "each" of the graphite particles. This contention by the Examiner is respectfully traversed. In connection therewith, and as is clear from claim 1, each graphite particle is made of a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other. It is the graphite particles, each of which is made of the plurality of flat graphite fine particulate, which has a layer of carbon formed thereon. It is respectfully submitted that Applicants' original specification is clear in describing that each of the graphite particles has the layer of carbon formed thereon.

Thus, attention is respectfully directed to paragraph [0018] bridging pages 8 and 9 of Applicants' specification, describing a non-aqueous secondary battery negative electrode material that "is a graphite particle of which surface is covered with carbon. Note also paragraph [0019] bridging pages 9 and 10 of Applicants' specification, and disclosing that as the graphite particle a block-like artificial graphite is preferable, and that when carbon is coated on a surface of such graphite particle, more excellent cycle characteristics and discharge load characteristics as the negative electrode material can be achieved. It is emphasized that the block-like artificial graphite is a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, as is clear film paragraph [0019] bridging pages 9 and 10 of Applicants' specification,

particularly the description on page 9; and it is respectfully submitted that it is clear that according to the present invention, as described in Applicants' original disclosure, for example, in paragraph [0019], as well as in claim 1, it is the graphite particles, each of which has the layer of carbon formed on the surface thereof, and not the plurality of flat graphite fine particulate, having the layer of carbon. Clearly, for example, paragraph [0019] describes the subject matter of present claim 1, sufficient to satisfy the description requirement of the first paragraph of 35 U.S.C. § 112.

In addition, attention is respectfully directed to paragraphs [0033] and [0034] on page 17 of Applicants' specification, describing formation of graphite particles covered with a thermoplastic polymer compound with the covered graphite particles being fired, and "thereby carbon having a small specific surface area is generated"; and that "when a surface of the graphite particle is covered [with the carbon], the specific surface area becomes smaller to result in a negative electrode material having a small "initial irreversible capacity". It is respectfully submitted that this also shows that Applicants contemplated as part of their mention, as of the filing date of the present invention, that a layer of carbon is formed on the surface of each of the graphite particles.

Note also paragraph [0037] on pages 19 and 20 of Applicants' specification, describing that when the graphite particles covered with the thermoplastic polymer compound are fired to carbonize the thermoplastic polymer compound, graphite particles covered with carbon can be obtained, this paragraph further describing that the graphite particles covered with the thermoplastic polymer compound are preferably fired in a non-oxidizing atmosphere. Certainly, such disclosure provides a description of a

layer of carbon being formed on the surface of each of the graphite particles, as well as that such layer "consists of" carbon.

As a key feature of the present invention is that this layer is of carbon, and it is respectfully submitted that the specification as a whole, including, for example, above-referred-to disclosures on pages 17 and 19, describe that this layer "consists essentially of" carbon.

Attention is also directed to the disclosure in paragraphs [0047] - [0057] on pages 23-27 of Applicants' specification, in the Examples in the above-identified application, disclosing (1) formation of the graphite particles, each having a structure where a plurality of flat particulate assembled or bonded with each other non-parallel are formed (see paragraph [0047] on page 23 of Applicants' specification, and describing (2) the formation of the carbon layer on each of the graphite particles (in paragraph [0057] on pages 26 and 27 of Applicants' specification). The examples also support the recitation in claim 1 of a layer of carbon formed on the surface of each of the graphite particles, each particle having a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other sufficient to satisfy the requirements of the first paragraph of 35 U.S.C. § 112.

As can be seen in the foregoing, it is respectfully submitted that Applicants have clearly abutted the conclusion by the Examiner that "there is no support in the original specification for the limitation layer of carbon formed on the surface of each of the graphite particles" (emphasis and original); to the contrary, clearly Applicants' original disclosure describes a layer of carbon formed on the surface of each of the graphite

particles, with the graphite particles each having a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other.

As seen in the foregoing, Applicants have also shown that their original specification describes a layer consisting essentially of, and consisting of, carbon. The contention by the Examiner in the second paragraph on page 3 of the Office Action dated October 14, 2009, that nitrobenzene is included as one of the possible compounds forming the layer of carbon, which teaches away from the recitations "layer that consists of carbon", or "layer that consists essentially of carbon", is respectfully traversed. As is clear from the paragraph [0035] bridging pages 17 and 18 of Applicants' specification, and especially in lines 6-4 from the bottom of this paragraph, the nitrobenzene is used as a solvent for the thermoplastic polymer compound that is carbonized, and is removed from the layer during the carbonizing. That is, the nitrobenzene is not carbonized, but rather is a solvent for the compound carbonized. Thus, the Examiner clearly errs in relying on nitrobenzene, being one of the possible compounds forming the layer of carbon, as providing a basis for the conclusion that there is no support in the original specification for the layer consisting of, or consisting essentially of, carbon; as nitrobenzene clearly is a solvent for the thermoplastic polymer that is carbonized, and not the thermoplastic polymer per se, clearly nitrobenzene is not one of the possible compounds forming the layer of carbon.

Applicants respectfully traverse the rejection of their claims under 35 U.S.C. § 103 as set forth in the Office Action dated October 14, 2009, and respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the

Office Action mailed October 14, 2009, that is, the teachings of U.S. Patent Application Publication No. 2001/0033822 to Ishii, et al., and Japanese Patent Document No. 2000-203818 to Takei, et al., under the provisions of 35 USC 103.

It is respectfully submitted that the teachings of these references as applied by the Examiner would have neither taught nor would have suggested such a nonaqueous electrolyte secondary battery negative electrode material, or the nonaqueous electrolyte secondary battery negative electrode using such material or nonaqueous electrolyte secondary battery using such negative electrode using such material, as in the present claims, including, inter alia, wherein each of the graphite particles included in the negative electrode material has a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, and each of the graphite particles has a layer of carbon formed on the surface of such graphite particle, with a ratio (by weight ratio) of the layer of carbon to a respective graphite particle being in the range of 0.001-0.01; and wherein the graphite particles have a volume of fine pores in the range of 10 to 10^5 nm in a volume of 400 to 2000 cm^3/kg. See claim 1.

As will be discussed further infra, each of the graphite particles have a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, with a layer of carbon formed on the surface of each of the graphite particles (each particle being made of the specified fine particulate). It is respectfully submitted that the teachings of these applied references do not disclose, nor would have suggested, the layer of carbon formed on the surface of each of the graphite particles, or additional features of the present invention as in claim 1, including further

definition of each of the graphite particles or weight ratio of the layer of carbon to a respective graphite particle, as in the present claims, and advantages thereof.

More particularly, it is respectfully submitted that the teachings of these applied references would have neither disclosed nor would have suggested such material as in the present claims, having the layer of carbon with the weight ratio of the layer of carbon to a respective graphite particle as in the present claims, and wherein this layer "consists essentially of" (see claim 12), or "consists of" (see claim 13), carbon; and/or wherein the carbon covers the respective graphite particle (see claim 14).

In addition, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such material as in the present claims, having the layer of carbon with weight ratio of layer of carbon to the respective graphite particle, and the volume of fine pores, as in claim 1, and, additionally, wherein the material has features as in the remaining dependent claims, including average particle diameter, true specific gravity, bulk density, specific surface area and Raman spectrum analysis R value as in claim 2; and/or slurry viscosity as in claims 3 and 10; and/or bulk density and rate of variation of bulk density as in claims 4 and 11.

The present invention relates to material for a negative electrode of a nonaqueous electrolyte secondary battery, and the negative electrode and the secondary battery formed respectively using such material and such negative electrode. The nonaqueous electrolyte secondary battery formed using such electrode and material can suitably be used in portable electronic devices, electric automobiles, electricity storage or the like.

Graphite particles for negative electrode material, in which a plurality of flat particulate are assembled or bonded so that a plurality of alignment surfaces may be non-parallel with each other, thereby forming the graphite particles, have been proposed, as described in the paragraph bridging pages 3 and 4 of Applicants' specification. However, as described in the first four lines on page 4 of Applicants' specification, there is a problem that the charging capacity (charge load characteristics) when the battery using such graphite particles is charged at a high speed, is low.

While, as described in the sole full paragraph on page 4 of Applicants' specification, it has been disclosed to coat a surface of a graphite particle with low crystalline carbon, the published application disclosing such coating does not mention any advantage in connection with charge load characteristics.

Against this background, Applicants provide negative electrode material for a nonaqueous electrolyte secondary battery, which has excellent discharge capacity, charge/discharge efficiency and charge load characteristics. Applicants have found that by providing a layer of carbon on the surface of each of the graphite particles, which graphite particle has a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, with a ratio (by weight ratio) of the layer of carbon to a respective graphite particle being in a range of 0.001-0.01, objectives according to the present invention are achieved. That is, as described in the paragraph bridging pages 8 and 9 of Applicants' specification, when the ratio of the carbon layer to graphite particle is less than 0.001, an improvement width in the charge load characteristics is small; while when the ratio exceeds 0.01, the initial charge/discharge efficiency is deteriorated. By providing the weight ratio as in the

present claims, charge load characteristics are excellent, with excellent initial charge/discharge efficiency.

In addition, the presently claimed subject matter includes graphite particles having a volume of fine pores in the range of 10-10^5 nm in a volume of 400-2000 cm^3/kg. When the volume of pores in the range is less than 400 cm^3/kg, the discharge load characteristics and the discharge capacity tend to decrease, while, on the other hand, when the volume exceeds 2000 cm^3/kg, the cycle characteristics tend to deteriorate. Note the paragraph bridging pages 9 and 10 of Applicants' specification.

As to advantages achieved by the present invention, note also the paragraph bridging pages 21 and 22 of Applicants' specification.

In connection with advantages achieved according to the present invention, note, in particular, Table 4 on page 31 of Applicants' specification, particularly Examples 1-4 of the present invention as compared with Comparative Examples 2 and 3, respectively containing ratios greater than, and less than, the ratio range in the present claims. As stated in the first paragraph on page 32 of Applicants' specification, it can be seen that material according to the present invention is excellent in discharging capacity, charge/discharge efficiency and charge load characteristics.

In the Amendment filed July 14, 2009, in the paragraph bridging pages 10 and 11 thereof, Applicants relied on evidence (that is, experimental data) in their specification as showing unexpectedly better results achieved by the present invention. Such unexpectedly better results provide a basis for a conclusion of unobviousness of the presently claimed subject matter. While Applicants have relied on such evidence, such evidence apparently has been ignored by the Examiner, as no comments in connection

therewith have been made in the Office Action dated October 14, 2009. Such failure to consider objective evidence is clearly improper. See Manual of Patent Examining Procedure (MPEP) 716.01(a). Note, in particular, the statement in this section of the MPEP that Examiners must consider comparative data in the specification which is intended to illustrate the claimed invention, in reaching a conclusion with regard to the obviousness of the claims. See In re Margolis, 228 USPQ 940 (CAFC 1986); and In re DeBlauwe, 222 USPQ 191 (CAFC 1984). It is respectfully submitted that this evidence in Applicants' specification must be considered in determining patentability; and, properly considered, it is respectfully submitted that this evidence establishes unobviousness of the presently claimed subject matter, even were the teachings of the applied prior art to establish a prima facie case of obviousness.

Takei, et al. discloses composite carbon particles containing a graphite part, an amorphous carbon part and silicon, the composite carbon particle being produced by mixing a graphitic particle with an organosilicon compound and a carbon precursor, heating the resultant mixture and decomposing and carbonizing the organo silicon compound and carbon precursor. Note the English language abstract of Takei, et al. Note also paragraphs [0011] and [0012] of this patent document, describing, inter alia, that the graphite particles are graphite particles in which flat-shaped particles gather or combine with non-parallel relationship.

As recognized by the Examiner, e.g., in the first full paragraph on page 4 of the Office Action mailed October 14, 2009, Takei, et al. would have neither disclosed nor would have suggested such features of the present invention including, inter alia, the aspect ratio, or ratio (by weight ratio), or pore volume, as in the present claims.

Moreover, it is respectfully submitted that Takei, et al. would have neither disclosed nor would have suggested, and in fact would have taught away from, such material as in the present claims, including the specified layer of carbon on the surface of each of the graphite particles, having the recited ratio of the layer of carbon to a respective graphite particle of 0.001 to 0.01, or wherein the layer consists essentially of carbon (see claim 12), or consists of carbon (see claim 13), as in various of the present claims. In this regard, it is noted that Takei, et al. requires silicon in the material covering the graphite grains.

It is respectfully submitted that the additional teachings of Ishii, et al. would not have rectified the deficiencies of Takei, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Ishii, et al. discloses graphite particles for use in a negative electrode for lithium secondary batteries, the graphite particles being obtained by assembling or binding together a plurality of flat-shaped particles so that the planes of orientation do not become parallel to one another. Note, in particular, paragraphs [0013] and [0014] on page 1 of this patent publication. As applied by the Examiner, note also paragraphs [0065] and [0071]-[0075] on page 5 of this patent document, disclosing that the graphite paste used in forming the negative electrode for the lithium secondary battery includes an organic binder, which organic binder can be polyethylene, polypropylene, ethylene-propylene terpolymer, butadiene rubber, styrene-butadiene rubber, butyl rubber, polymeric compounds having a high ionic conductivity, and the like.

Contrary to the contention by the Examiner, it is respectfully submitted that the combined teachings of Takei, et al., and Ishii, et al., would have neither disclosed nor would have suggested the presently claimed invention, including, inter alia, the layer of carbon on the surfaces of the graphite particles, and with the ratio (by weight ratio) of the layer of carbon to a respective graphite particle, among other features as discussed

respectfully traversed. As applied by the Examiner, Ishii, et al. discloses a binder. Ishii, et al. discloses that a mixing ratio between the graphite particles and the binder (not a layer of carbon formed on the surface of each of the carbon particles) is utilized in the recited amount by weight, per 100 parts by weight of graphite particles. It is respectfully submitted that the binder in Ishii, et al. is used for bonding graphite particles with each other, and not for forming a layer on a surface of the graphite particle. It is respectfully submitted that such binder disclosed in Ishii, et al., would have neither taught nor would have suggested the layer of carbon formed on the surface of the graphite particles as in the present claims, much less in the weight ratio as in the present claims, and advantages achieved thereby.

Thus, it is respectfully submitted that the binder in Ishii, et al., is a binder necessary to produce negative electrode material for a secondary battery, and is used to bond between a negative electrode material and a current collector. It is respectfully

submitted that this binder material in Ishii, et al. is not for forming a layer of carbon on a surface of the graphite particles.

As Ishii, et al. discloses a binder material for, e.g., bonding the graphite particles to a current collector, amount of binder as disclosed in Ishii, et al. would have neither taught nor would have suggested the weight ratio of carbon layer to graphite particle as in the present claims, and advantages thereof.

Thus, while the Examiner relies on the teachings of Ishii, et al. as disclosing the weight ratio in the present claims, as discussed in the paragraph bridging pages 5 and 6 of the Office Action mailed October 14, 2009, in view of the purpose of the binder in Ishii, et al., including its purpose of binding to the current collector, it is respectfully submitted that the teachings of Ishii, et al., even in combination with the teachings of Takei, et al., would have neither disclosed nor would have suggested the presently claimed subject matter, including, inter alia, layer of carbon or weight ratio of the layer of carbon to the graphite particles, on the surface of the graphite particles, in particular covering the graphite particles, and advantages achieved thereby.

The contention by the Examiner in the paragraph bridging pages 3 and 4 of the Office Action dated October 14, 2009, that the flat shaped, non-spherical, non-parallel shape of particles is the equivalent of Applicants' graphite particles, is respectfully traversed. It is respectfully submitted that the flat-shaped particles in Takei, et al., are the individual particles with a flat shape, which gather or combine with non-parallel position. In contrast, the graphite particles according to the present invention each have a structure where a plurality of flat graphite fine particulate assembles of bonds non-parallel with each other. That is, each of the graphite particles of the presently claimed

subject matter is constructed of a plurality of flat graphite fine particulates. It is respectfully submitted that Takei, et al. would have neither taught nor would have suggested such feature of the present invention, with the layer of carbon formed on the surface of each of the graphite particles, the particles being formed of the specified particulate, and with a ratio (by weight) of the layer of carbons to a respective graphite particle, as in the present claims, and advantages thereof.

The contention by the Examiner on page 9 of the Office Action dated October 14, 2009, that there is no support for the amendment (apparently, the "each of" language of claim 1) in the original specification and that, accordingly, the teachings of the prior art still meet the claimed limitation, is respectfully traversed. Initially, and as established fully in the foregoing, clearly Applicants' original disclosure describes that each of the graphite particles have a structure where a plurality of flat graphite fine particulate assembles or bonds non-parallel with each other, with a layer of carbon formed on the surface of each of the graphite particles (claim 1 not reciting a layer of carbon formed on the surface of each of the flat graphite fine particulate).

In any event, it is respectfully submitted that all recitations set forth in the claims must be considered, in determining the issue of obviousness.

In the Office Action mailed October 14, 2009, the Examiner repeatedly contends that various properties recited in the claims (see claims 2-4, 10 and 11) are inherent in the structure of Takei, et al. Such contentions are respectfully traversed. The material of the present invention differs from the material of Takei, et al., even as indicated by the Examiner (note that a combination of teachings of references has been applied),

and the properties in the present claims have not been shown to be inherent in the material of Takei, et al.

In view of the foregoing comments, as well as in light of the evidence in Applicants' specification, entry of this Request for Reconsideration, full consideration of the evidence of record, and reconsideration and allowance of all claims presently pending in the above-identified application, are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 1204.46017X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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